

REMARKS

By the present amendment, claim 116 has been amended. No claims have been added or cancelled. Accordingly, claims 55-131 are presently pending, of which claims 55, 115 and 116 are the independent claims. Rejoinder of claims 76-114 and 117-131, which presently stand withdrawn from consideration, is respectfully requested pursuant to 37 C.F.R. § 1.141, as discussed in greater detail below. Accordingly, favorable reconsideration and allowance of claims 55-131 is respectfully requested. This submission is accompanied by a Request for Continued Examination (RCE).

Applicants wish to thank the Examiner for having withdrawn the previous grounds of rejection under 35 U.S.C. §103 based on upon the Nodwell and Uemura references.

Claim Objections

The Examiner has objected to claim 116, on the ground that in the last line, "said irradiance flash" should be "said electromagnetic radiation".

By the present amendment, claim 116 has been amended as suggested by the Examiner. Applicants therefore respectfully submit that this ground of objection has been overcome.

35 U.S.C. § 103(a): claims 55, 56, 115 and 116

The Examiner has raised a new ground of rejection based upon a newly cited reference, rejecting claims 55, 56, 115 and 116 under 35 U.S.C. § 103(a) as being unpatentable over Tim. Applicants understand from a telephone conversation with the Examiner that the reference identified as "Tim" in the present Office Action is U.S. Patent No. 6,849,831 to Timans et al. ("Timans"), which was cited by the Applicants in an Information Disclosure Statement filed August 22, 2007.

Applicants respectfully submit that the Timans reference fails to satisfy the requirements for a finding of obviousness of claims 55, 56, 115 and 116. Applicant's submissions in this respect have been prepared in light of the recently published "Examination Guidelines for Determining Obviousness Under 35 U.S.C. § 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*" (Federal Register, Vol. 72, No. 195, Oct. 10, 2007, pp. 57526 – 57535) (the "Guidelines").

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 at 17-18 (1966), the Supreme Court set out the following objective framework for applying the statutory language of §103:

"Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented."

Accordingly, the Guidelines confirm that obviousness is a question of law based on underlying factual inquiries. The factual inquiries enunciated by the Court in *Graham* are as follows:

- (1) Determining the scope and content of the prior art;
- (2) Ascertaining the differences between the claimed invention and the prior art; and
- (3) Resolving the level of ordinary skill in the pertinent art.

With respect to the second of the *Graham* factual inquiries, Applicants respectfully submit that important differences exist between the claimed

invention and the cited Timans reference. In this regard, independent claim 55 recites:

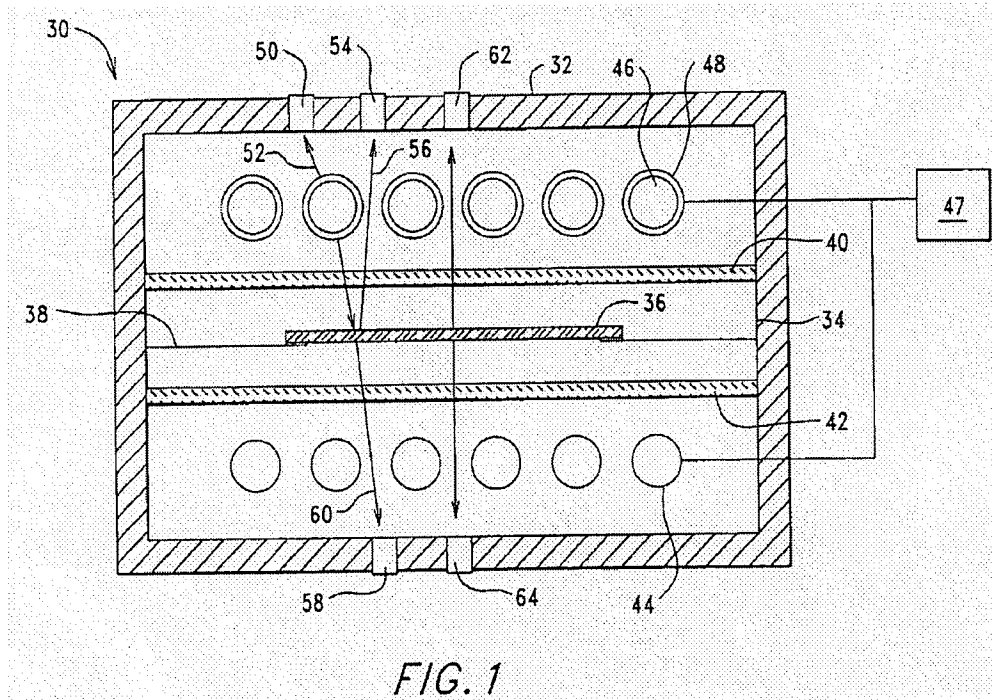
55. (Original) An apparatus for producing electromagnetic radiation, the apparatus comprising:
- a) an electrically insulated flow generator configured to generate a flow of liquid along an inside surface of an envelope; and
 - b) first and second electrodes configured to generate an electrical arc within the envelope to produce the electromagnetic radiation.

Applicants respectfully note that the wording “the envelope” in subparagraph (b) refers back to the antecedent “envelope” recited in subparagraph (a) of claim 55. Therefore, it is clear from the wording of claim 55 that the envelope within which the electrodes generate the electrical arc is the same envelope recited in subparagraph (a). Thus, claim 55 requires an electrically insulated flow generator configured to generate a flow of liquid along an inside surface of an envelope, and also requires first and second electrodes configured to generate an electrical arc within that same envelope. An illustrative example of such a configuration is shown in the drawings of the present application, in which an electrically insulated flow generator 150 generates a cooling flow of liquid along an inside surface 102 of the envelope 104, within which two electrodes (a cathode 106 and an anode 108) are configured to generate an electrical arc. It appears from the Examiner’s comments that the Examiner may have inadvertently overlooked this aspect of claim 55, as discussed below.

Timans discloses pulsed processing semiconductor heating methods using combinations of heating sources. A background heating mode generally produces a temperature rise throughout the object during background heating.

A first surface of the object is then heated in a pulsed heating mode by subjecting it to at least a first pulse of energy.

Figure 1 of Timans is reproduced below for the Examiner's convenience:



As shown in Figure 1, Timans discloses tungsten-halogen lamps 44 disposed in a parallel array below the backside of a substrate 36. Arc lamps 46 are provided in a parallel array above the front side or device side of the substrate 36. Timans discloses that the arc lamps 46 may be air or water cooled (not shown), and that a water jacket (not shown) may be placed over the quartz envelopes of the lamps to selectively filter the pyrometer wavelength. (Col. 11, lines 15-53.) Quartz windows 40 and 42 above and below the substrate serve to isolate the substrate 36 and support 38 from the lamps 46 and 44. These quartz windows 40 and 42 may be water-cooled by providing one or more channels (not shown) for water to flow along at least one of the surfaces of the windows. (Col. 10 line 53 – col. 11 line 1.)

The Examiner has suggested that Timans discloses a flow generator configured to generate a flow of liquid along an inside surface of an envelope, pointing to column 10, line 65 to column 11, line 3. However, this passage of Timans merely states that, "... Quartz windows 40, 42 may also be water-cooled by providing one or more channels (not shown) for water to flow along at least one of the surfaces of the windows. ..." However, the quartz windows 40, 42 of Timans are not envelopes. Rather, it is clear from Figure 1 of Timans that each of the windows 40, 42 is a planar window. Moreover, as noted above, claim 55 recites a flow generator configured to generate a flow of liquid along an inside surface of the same envelope within which the electrodes are configured to generate an arc. In contrast, neither of the windows 40, 42 of Timans is a component of an arc lamp, and an arc is not generated within either of these windows. Thus, the mere disclosure by Timans of a cooling flow of water along at least one surface of each of the quartz windows 40, 42 is clearly not a flow of liquid along an inside surface of an envelope within which electrodes are configured to generate an arc, as recited in claim 55.

Timans also discloses that the arc lamps 46 "may be air or water cooled (not shown)", and that lamp model 10F10 from PerkinElmer Optoelectronics is a suitable example of an arc lamp (col. 11, lines 42-46). However, there is nothing in Timans to suggest that such water cooling is achieved by a flow of liquid along an inside surface of the same envelope within which electrodes are configured to generate an arc. On the contrary, it appears that PerkinElmer's water-cooled arc lamps generally employ water cooling on the outside of the arc envelope, by channeling the water through a separate flow tube: see for example page 6, sub-heading "Cooling Considerations", of the reference entitled, "PerkinElmer Optoelectronics, "High Performance Flash and Arc Lamps", Brochure, 39 pages, as available from <http://optoelectronics.perkinelmer.com/content/RelatedLinks/flashcatalog.pdf> on January 6, 2004", which was submitted in Applicants' Information Disclosure Statement filed May 26, 2006 in connection with the present application.

Thus, Timans fails to disclose or suggest, a "... flow generator configured to generate a flow of liquid along an inside surface of an envelope", wherein the envelope is the same envelope within which electrodes are configured to generate an electrical arc, as recited in claim 55.

In addition, as the Examiner has agreed, Timans fails to disclose a flow generator that is "electrically insulated" as recited in claim 55. However, the Examiner has stated:

"However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the flow generator electrically insulated because it is well known in the art that where electric arc lamps and liquid exist near the lamps, electrical insulations [sic] needs to be installed for the purpose of preventing short circuiting between the lamps or within the lamps".

Thus, the Examiner appears to have asserted that it would have been well known in the art to electrically insulate the electrical arc from the water or liquid coolant, to prevent short circuiting. Applicants respectfully submit that this assertion is incorrect, and respectfully disagree that the above assertion reflects anything well known in the art. On the contrary, electrically insulating the electrical arc from the water coolant would render the resulting arc lamp unsuitable for its intended purpose. In this regard, as discussed above, the wording of claim 55 itself requires the electrically insulated flow generator to generate a flow of liquid along an inside surface of the same envelope within which the electrodes are configured to generate the electrical arc. Although Timans does not disclose such a flow generator, Applicants respectfully invite the Examiner to revisit U.S. Patent No. 4,027,185 to Nodwell et al., which the Examiner has already considered in connection with the Office Action mailed November 17, 2006, and which the Examiner has cited in connection with various dependent claims in the present Office Action. As explained in Nodwell (Abstract and col. 1, lines 60-64), one of the main functions of such a

flow of liquid along the inside surface of the arc envelope is constrict and cool the electrical arc itself, thereby providing a positive dynamic impedance to the arc. Thus, claim 55 requires the electrically insulated flow generator to generate a flow of liquid along an inside surface of the same envelope within which the electrodes are configured to generate the electrical arc. Therefore, in claim 55, the electrical arc is not electrically insulated from the flow of liquid along the inside surface of the envelope in which the arc is generated, nor would it be desirable to provide such insulation, as this would defeat one of the main purposes of such an arc lamp. Accordingly, even if Timans were modified to include a flow generator as disclosed in Nodwell (a combination which Applicants do not admit would be obvious), the Examiner's stated rationale for modifying such a flow generator would result in electrical insulation between the electrical arc and the cooling flow of liquid, thereby defeating the purpose of providing such a flow generator and rendering the arc lamp unsuitable for its intended purpose.

In summary, important factual differences exist between the subject-matter of claim 55 and the cited Timans reference.

In particular, Timans fails to disclose or suggest, a "flow generator configured to generate a flow of liquid along an inside surface of an envelope", wherein the envelope is the same envelope in which "first and second electrodes [are] configured to generate an electrical arc", as recited in claim 55.

In addition, as conceded by the Examiner, Timans also fails to disclose or suggest a flow generator that is "electrically insulated", as recited in claim 55.

Thus, in view of the above differences, Applicants respectfully submit that the second of the three *Graham* factual inquiries strongly supports a finding of non-obviousness of independent claim 55. Applicants further respectfully submit that neither the first nor the third of the *Graham* factual inquiries detracts from a finding of non-obviousness in the present case. Applicants therefore respectfully submit that the subject-matter defined by claim 55 would

not have been obvious to one of ordinary skill in the art upon consideration of all of the relevant facts, and respectfully request that the rejection of claim 55 under 35 U.S.C. § 103(a) be withdrawn.

Claim 56 is dependent upon claim 55. Applicants therefore respectfully request withdrawal of the rejection of claim 56 due to its dependency, as well as the additional subject-matter that it recites.

Independent claims 115 and 116 recite limitations similar to those discussed above in connection with claim 55. Applicants therefore respectfully request withdrawal of the rejections of claims 115 and 116, for reasons including those presented above in connection with claim 55.

35 U.S.C. § 103(a): Claims 57-75

The Examiner has rejected claims 57-63, 66, 69, 70 and 75 under 35 U.S.C. § 103(a) as being unpatentable over Timans in view of U.S. Patent No. 4,027,185 to Nodwell.

The Examiner has also rejected claims 64, 65, 71 and 72 under 35 U.S.C. § 103(a) as being unpatentable over Timans in view of Nodwell, and in further view of U.S. Patent No. 6,621,199 to Parfeniuk.

The Examiner has also rejected claims 67 and 68 under 35 U.S.C. § 103(a) as being unpatentable over Timans in view of Nodwell, and in further view of U.S. Patent No. 5,753,106 to Schenck.

The Examiner has also rejected claim 73 under 35 U.S.C. § 103(a) as being unpatentable over Timans in view of Nodwell, in further view of Parfeniuk, and in further view of U.S. Patent No. 5,137,659 to Ashley.

The Examiner has also rejected claim 74 under 35 U.S.C. § 103(a) as being unpatentable over Timans in view of Nodwell, in further view of Parfeniuk, and in further view of U.S. Patent No. 6,465,799 to Kimble.

Claims 57-75 are directly or indirectly dependent upon claim 55, which Applicants respectfully submit has been shown to be allowable. Applicants therefore respectfully request withdrawal of the rejections of claims 57-75 due to their dependencies, as well as the additional subject-matter that each of these claims recites.

Election / Restrictions: Request for Rejoinder of claims 76-114 and 117-131

Rejoinder of claims 76-114 and 117-131, which are presently pending but withdrawn from consideration, is respectfully requested pursuant to 37 C.F.R. § 1.141.

In this regard, claims 76-114 and 117-119 are directly or indirectly dependent upon independent claim 55, while claims 120-131 are directly or indirectly dependent upon independent claim 116.

Independent claims 55 and 116 are both generic to all relevant alleged species identified by the Examiner to which their dependent claims 56-114 and 117-131 pertain, and therefore, claims 55 and 116 are both linking claims as discussed in M.P.E.P. § 809.03. As independent claims 55 and 116 have been shown to be allowable, applicants respectfully request that their dependent claims 76-114 and 117-131 be rejoined in this application and allowed, pursuant to 37 C.F.R. § 1.141.

Update Regarding Copending Application

Applicants have previously notified the Examiner of the existence of commonly owned copending application no. 10/979,447 (publication no. US

2005/0062388). This application was previously allowed but a request for continued examination (RCE) was subsequently filed by Applicants. A new non-final Office Action was mailed on October 9, 2007. Although a further Information Disclosure Statement is being concurrently filed, the IDS omits most of the references cited in the 10/979,447 Office Action, which are either already of record or cumulative to references already of record, or are otherwise not believed to be material to patentability of the present application. Applicants respectfully invite the Examiner to monitor the status of application no. 10/979,447, in the event that the Examiner may view its allowance or any other event during its prosecution as relevant to the present application.

Conclusion

In view of the foregoing, Applicants respectfully submit that the present application is in condition for allowance, and respectfully request that a Notice of Allowance be issued.

Should there be any questions concerning this application, the Examiner is respectfully invited to contact the undersigned agent at the telephone number appearing below. Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

Knobbe, Martens, Olson & Bear

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By: Che S. Chereskin
Che Swyden Chereskin
Registration No. 41,466
Agent of Record
Customer No. 20,995
(949) 721-6385